

Section 2 Traffic

2-201 References

2-202 Objective

2-203 Planning

2-204 Responsibilities and Procedures

- 2-204A Resident Engineer
- 2-204B State Representative
- 2-204C Construction Safety Coordinator
- 2-204D Construction Engineer

2-205 Guidelines for Traffic Control Plans

- 2-205A Basic Instruction
- 2-205B General Considerations

2-206 Elements of a Roadway

- 2-206A Geometrics
- 2-206B Cross-Over Transitions
- 2-206C Existing Ramps
- 2-206D Run-Off Area
- 2-206E Lane Widths
- 2-206F Lateral Shifting
- 2-206G Surfacing Materials--Color and Texture
 - 2-215A (11) COZEEP Procedures

2-207 Speed Zones

2-208 Night Work

2-209 Delineation

2-210 Ramp Closures

2-211 Informing the Public

2-212 Keep it Clear and Clean

2-213 Roadways Over Railroad Tracks

2-214 Transportation Management Plans

2-215 Construction Zone Enhanced Enforcement Program

2-215A COZEEP Guidelines

2-215A (1) Estimating Funding

2-215A (2) Redirection of Project Funds

2-215A (3) Obtaining Additional Funds

2-215A (4) Responsibility of the Project Engineer

2-215A (5) Responsibility of the Resident Engineer

2-215A (6) Using COZEEP on Freeways and Expressways

2-215A (7) Using COZEEP on Connectors and Ramps

2-215A (8) Using COZEEP on Conventional Highways

2-215A (9) Risk Factors

2-215A (10) Estimating COZEEP Funding Requirements



Section 2 Traffic

2-201 References

Section 124 of the Streets and Highways Code authorizes Caltrans to close or restrict the use of any state highway whenever Caltrans considers such actions necessary for the following reasons:

- To protect the public
- To protect a highway from damage during storms, after major earthquakes, or other natural disasters
- To protect a highway during construction, improvement, or maintenance operations

Traffic control systems conform to the *Standard Plans*, unless the contract specifies otherwise.

All signs, lights, and devices must conform to Section 12, “Construction Area Traffic Control Devices,” of the *Standard Specifications*. For how to apply signs, lights, and devices used on construction projects, review the current version of the *Manual of Traffic Controls for Construction and Maintenance Work Zones (Manual of Traffic Controls)*.

2-202 Objective

The objective of this section is to provide for worker protection and the safe passage of public traffic through and around construction with as little inconvenience and delay as possible.

2-203 Planning

Providing for worker safety and the safe movement of traffic through construction zones starts with planning. A traffic control plan must be included in all contract plans and special provisions. Before the district submits the plans, specifications & estimate to headquarters, the district construction plans and specifications reviewer must review the plan.

The plan must be adequate for conditions that will be encountered during construction. The reviewer should determine that the plan can be implemented and that it adequately facilitates the movement of traffic. Any comments or suggestions regarding traffic control should be discussed with district design and traffic units during the project’s planning and design phase.

Section 2

Traffic

2-201

References

2-202

Objective

2-203

Planning

2-204 Responsibilities and Procedures

2-204 Responsibilities and Procedures

The following outlines the responsibilities and procedures for each of the key personnel involved in traffic control.

2-204A Resident Engineer

The resident engineer has the responsibility and authority for administering the traffic control plan and all other aspects of safety on construction projects. The resident engineer may delegate the administration of traffic control to another person assigned to the project, preferably to the project safety coordinator. For the duties and responsibilities of the project safety coordinator, see Section 2-1, "Safety," of the *Construction Manual* (manual).

Once assigned to the project, the resident engineer should perform the following administrative duties:

- Compare the plan for traffic handling to the conditions found at the site. Note any unusual local traffic movements and the movements of emergency vehicles. Include in the preconstruction conference a discussion of the traffic control plan. For details related to preconstruction conferences, see Section 5-003, "Preconstruction Conferences with the Contractor," of this manual.
- Modifications of the traffic handling plan may be considered at this point. Given the specifics of a contractor's needs, it may be possible to provide improved traffic service over the service originally contemplated. Changes requested by the contractor must provide at least equal traffic service to receive favorable consideration.
- Changes made in existing contract plans and specifications or new plans and specifications covering unanticipated conditions or conditions not fully delineated in the contract must be covered by contract change order. Such ordered changes must include plans in sufficient detail to define all elements of the proposed changes and roadway design.
- The district will establish a procedure for the preparation, review, and approval of changes related to roadway construction and detour plans that include signs and other traffic control devices. Generally, the district traffic unit is responsible for this review activity.
- Some unpredictable, immediate situations of a minor nature or short duration will arise during the work and will require good judgment to obtain optimum results. In these instances, formally approved plans are not required, but delineate or specify what is to be done and record in writing actions taken and orders given.
- To establish the geometry, markings, devices, and signs that existed at any time during the project, maintain in sufficient detail a record of the placement into service, changes, and discontinuance of roadways and detours. The form of the record may vary according to the magnitude and complexity of the subject. Dated notations or revisions to plans may be helpful. Dated photographic or video tape records, particularly of points of transition or difficult situations, may be very valuable.
- If the contractor's operations interfere with or cause potential safety problems with vehicular or pedestrian traffic, contact the contractor immediately and request correction of the deficiency. If necessary, direct the contractor in writing to act at once to remedy the unsatisfactory situation. Caltrans work forces should be

called upon only when necessary, because of a physical inability of the contractor or a refusal by the contractor to act. A contractor's failure to perform is cause to order the cessation of the operations.

2-204B State Representative

Where the contract is administered by others, oversight of traffic through and around a construction zone involves overseeing and working with the local entity or private sponsor's resident engineer. The state representative assigned to the project must make sure the resident engineer performs the duties as outlined above.

For all changes to the district approved traffic control plans on contracts administered by others, use the same review and approval process established for projects administered by Caltrans.

As a last resort, the state representative has the authority to stop the contractor's operation wholly or in part or take appropriate action when public safety is jeopardized.

2-204C Construction Safety Coordinator

Section 2-1, "Safety," of this manual covers the duties of the district's construction safety coordinator. Here we further detail the coordinator's duties related to traffic handling.

The district's construction safety coordinator must periodically review the traffic handling for each project. Some reviews should take place at night, particularly when a major traffic change has taken place. The coordinator must document these reviews in the project records and discuss any apparent deficiencies in the traffic control plan or problems in traffic safety with the construction engineer, traffic engineer, and resident engineer. Instead of the construction safety coordinator, a specialist from the district traffic unit may perform the traffic reviews provided the required documents and discussions are included in the project records.

2-204D Construction Engineer

A construction engineer is responsible for ensuring that traffic handling through construction projects conforms to the specified traffic control plans. If the plans are modified by contract change order, construction engineers must take the necessary steps to ensure that the modified plans are adequate to provide the highest level of traffic safety and service consistent with the conditions actually encountered. During routine visits to the project, construction engineers should also include reviews of signing, delineation, and general traffic handling.

2-205 Guidelines for Traffic Control Plans

The following are some basic guidelines and general considerations for traffic control plans.

2-205A Basic Instruction

The following instructions usually apply more to the planning and design phase of a project. They are included here to help provide construction personnel with some basic concepts for safe and efficient traffic flow through a highway construction project. Use these guidelines when it is necessary to make changes in traffic control plans during construction.

- Whenever possible, permit traffic continued undiminished use of the existing facilities.
- When such use is not possible, accommodate traffic by ensuring a continuous

2-205

Guidelines for Traffic Control Plans

roadway throughout the length of the project. To ensure this continuous roadway is achieved, use one or a combination of the following:

1. The existing unmodified highway
 2. The newly constructed highway or portions of it
 3. Interim constructed facilities
 4. A detour where traffic is diverted over a temporary roadway
 5. Allowing traffic to pass through the work in progress
- Ensure the temporary roadway is engineered to the highest standards practically possible. Apply the same type of design considerations as those incorporated into the new construction. These considerations include the following:
 1. Geometrics of alignment and roadway section
 2. Surface of the traveled lanes and shoulders or marginal areas
 3. Pavement markings and other delineations
 4. Barrier and guardrail
 5. Signals and lighting
 6. Signing
 - Show the design of the temporary roadway in the traffic control plan.
 - Make safety and convenience the first design consideration. Economy will be a factor only as it is necessary to obtain balance between benefits and resources. By itself, cost must not be a primary limiting factor.

2-205B General Considerations

There is no formalized solution and design that applies to all situations. The following guidelines are intended only to guide engineering judgment and ingenuity:

- The engineer's job is to create a physical facility that will induce motorists to make the proper responses to guide their vehicles in the intended path of travel and that will make it possible for the vehicle to react as intended.
- The path the car is intended to follow, the traffic lane, is the most important single element of the roadway. The following are elements that affect the driver's ability to follow the intended path:
 1. The lane's geometry
 2. Pavement surface condition, texture, and color
 3. Pavement markers and other delineation
 4. Signals, lighting, and signing.
- Try to eliminate surprise elements from temporary roadways. Make the environment like the approach highway, but if differences must exist, make the differences clearly apparent.
- Accident concentrations and inconvenience often occur with changes in direction,

number of lanes, alignment, and necessary change of speed. Compensate for a required reduction of one by an improvement of another. For example, compensate for a sharper curve with solutions such as an increased lane width or a runoff area.

- Visualize what effect the changing conditions of visibility and lighting will create. Glare conditions such as rain at night or facing the setting sun may impact driver decisions. Such conditions may alter the apparent pattern of the roadway and cause an eradicated line to appear to be a lane line. Consider how the shape and the light versus the shadow of falsework openings will appear both in day and night. Anticipate any needs for special treatments such as lighting.
- Review the project for evidence of driving difficulty. For instance, look for such signs as broken delineators, skid marks, and tire marks on temporary railing (Type K), all of which indicate a potential need for improvement. Be aggressive in seeking changes to improve the situation. Continue this appraisal through the life of the project. Each day a condition can change that may have an impact on the facilities' effectiveness.
- Reductions in the width or number of lanes affect the capacity and the traffic flow. When severe congestion is forecast because of capacity reductions, include plans for media notification, alternate route development, metering via upstream ramp closures, and use of changeable message signs.

2-206 Elements of a Roadway

The following are some guidelines for the design of roadways carrying traffic through construction areas:

2-206A Geometrics

For conditions shown on the plans that need adjustment, discuss any proposed changes with the district traffic unit. Include the following considerations for conditions requiring minor changes in the field:

- Design for the speed vehicles will travel, not the speed one hopes they will travel. The following determine the safe speed of a vehicle:
 1. Alignment
 2. Profile
 3. Cross section
 4. Pavement surface character
 5. Lateral clearances to obstructions
- On the mainline facilities, design the temporary roadway for speeds consistent with the permanent roadway. On highways where the prevailing speed of the approach is limited by alignment, the design speed should be equal to the prevailing speed of the approach roadway. If this equality is not possible, ensure the design speed differential is no more than 15 km/h. The geometrics for a transition at the end of a high speed approach should be better than the geometrics that may be adequate for a situation within the construction area.
- Locate the approach transition so that it is visible to the approaching motorist.

2-206

Elements of a Roadway

Avoid placing the entering transitions on horizontal curves, just beyond horizontal curves, or beyond the crest of a summit vertical. The transition should be completed before reaching such features. The ideal transition is on a horizontal tangent with a slightly rising grade at the end of a level approach. Achieving this transition is worthwhile even though it may extend the traffic control system farther than the minimum necessary to just clear the construction area.

- If physically possible, in the transition give the driver at least the same effective traversable roadway width, and preferably more, as on the approach roadway. Adequate maneuver room at critical points is an important factor in preventing accidents.
- Design to require the least change, whether in change of direction, speed, or both. When changes are necessary, make one change at a time. For example, if the number of lanes must be reduced and the direction changed, complete the lane drop before starting the alignment change.

2-206B Cross-Over Transitions

The following guidelines apply to cross-over transitions:

- Design cross-over transitions to the highest geometric standards within tolerable limits of cost. Use flat diagonal crossing in preference to reversing curves.
- When cross-overs require the removal of median barriers or protective devices, review conditions, and where possible, maintain the integrity of the remaining portions of the devices. For example, anchor guardrail ends and install crash cushions.
- When cross-overs are not in use, place positive barriers across entry areas, including appropriate signing.

2-206C Existing Ramps

For temporary modifications of existing ramps, pay close attention to acceleration and deceleration lanes. Reducing standards on existing facilities, such as sharpening curves and shortening auxiliary lanes, can adversely affect the operating characteristics. Supplemental construction work may be necessary to retain the effective operating characteristics of the existing facility.

2-206D Run-Off Area

Whenever physically possible, establish and maintain a safely traversable area outside the delineated roadway of such width that there will be a run-off zone. To enhance night visibility, delineate material, equipment, excavations, or obstructions 4 m or more from the traveled way (outside of normal required protection parameters). Creating safe run-off areas may also require ordering the staging of certain elements of the work, cleanup grading, and temporary placement or removal of materials.

2-206E Lane Widths

Lane widths should be consistent with the widths of the approach roadway. A desirable standard consists of full-width lanes plus an effective width of constructed shoulder. To provide extra maneuvering room, provide wider lane widths or additional surfaced shoulder width in transitions and critical alignment.

2-206F Lateral Shifting

Construction situations frequently require a lateral shifting of traffic in relation to the normal path of travel. This lateral shift may involve dropping a lane. Use the standard formula for taper length as shown in the *Manual of Traffic Controls* or in the details included in the project's traffic control plan.

Before opening lanes to traffic, remove or obliterate all conflicting lines and markings. Day and night and under all weather conditions, obliterated lines and markings must be unidentifiable as pavement delineation.

2-206G Surfacing Materials—Color and Texture

The following guidelines apply to the color and texture of pavement surfacing materials:

- Surface all roadways and detours, except very temporary or minor facilities, with an appropriate material (in most cases asphalt concrete).
- The area where the surfacing joins the existing roadway can be very critical. If asphalt concrete joins asphalt concrete the difference in texture and color between the existing and new creates a taper in the new traffic lane that may convey the wrong sense of direction, especially at night or in rain. An inevitable degree of mismatch between the old and new surfaces creates a slight discontinuity that may cause a car to lurch or swerve. Avoid these difficulties by bringing the temporary surfacing back onto the existing highway in a square joint.
- A square joint is even more necessary when asphalt concrete joins portland cement concrete because at night and during rainy weather the joints often stand out more prominently than the traffic lane lines.
- When conditions prevent starting the temporary surfacing at a square joint on the existing pavement, the necessary continuity of the traveled lane can be established by a treatment such as a light sand seal. Establishing continuity of the traveled lane in some manner is especially necessary if previous traffic shifts have created confusing or conflicting diagonal joints and have eradicated pavement markings.

2-207 Speed Zones

The following guidelines apply to speed zones:

- If the safe operating speed of traffic through a construction area is significantly less than the approach speed of traffic on the highway, a reduced work zone speed limit may be established.
- Do not use a reduced speed limit as a substitute for other means of creating a safe roadway.
- Establish reduced speed limits in accordance with the procedures stated in the *Traffic Manual*. The district construction and traffic units must jointly review and agree to these limits. Also, it is advisable to discuss the limits with the California Highway Patrol. Participation in the Construction Zone Enhanced Enforcement Program (COZEEP) is a precondition for any project for which a reduced speed zone is proposed. See the heading “Construction Zone Enhanced Enforcement Program” later in this section.
- To avoid the necessity of obtaining more than one order for speed reduction per project, ensure the limits requested in the order cover the maximum distance where reduced speed would be required at any time during the life of the contract. Any part of the project within the limits stated in the order becomes a legal speed zone when signs are in place and displayed.
- It is imperative that the speed limit be posted only for the duration of the conditions justifying the reduction and only for those areas of the project within which it is unsafe at any and all times to travel at a speed in excess of the posted limit.

2-207 Speed Zones

- Speed limit signing may be considered during work operation parameters. When work operations are complete for the day, remove or cover the signs immediately. Implement temporary speed limit reductions in conjunction with a COZEOP operation.
- Use the posting of advisory speeds on appropriate warning signs to advise the public of what speed is considered appropriate at specific localized situations such as points of curvature or traffic diversion. The selected speed should be that at which the driver exercising due care would drive in normal conditions of light and weather.

2-208 Night Work

Frequently the special provisions for a project restrict work on the existing traveled way to a specified period at night. Based on traffic counts, the district traffic unit determines times for closing lanes and for night work.

The effectiveness of handling traffic through night construction depends upon the contract plans and upon the details of the contractor's operations. Require the contractor to submit and obtain approval of the plan or operations before proceeding with night work. Also, here are some details to consider:

- Avoid traffic splits if at all possible. Shift traffic to one side or to the other, but do not split it into two traffic streams. This requirement sometimes requires the closure of an extra lane.
- Confine the work area to as short a distance as is practical.
- The immediate work area should be well lighted by floodlights, but in such a way so as to not blind drivers of approaching vehicles. (See Section 7-1.06, "Safety and Health Provisions," of the *Standard Specifications*.) If properly shielded, most of the floodlights can be mounted on construction equipment. Ensure the intensity of the lighting is not any brighter than is necessary for inspection work.
- Ensure the contractor's plan of operation provides sufficient room for delivery vehicles so that none are ever forced to stop in the traffic lanes.
- Providing for exit ramp traffic within the limits of the coned-off area may be extremely difficult. Sometimes through traffic tends to follow an exiting vehicle. To expedite the work, it is helpful to temporarily close the exit if traffic patterns and volumes permit.
- In addition to the requirements for signs and warning devices shown on the plans for traffic control systems, changeable message signs in advance of the work may be used effectively. See Section 4-1203J, "Portable Changeable Message Signs," of this manual. You may also consult the district traffic unit.
- Use road flares to get motorists' attention only under emergency conditions. Take care to prevent fires in susceptible high-fire rated areas.
- For the use of amber flashing lights and for driving and parking in a closed lane at night, see the *Caltrans Safety Manual*.
- Either through illumination or suitable marking, ensure all equipment is visible to traffic.

- During daylight hours, mark in advance signs and lane closure locations. The resident engineer should review lane closure layouts for visibility and effectiveness. When possible, mark in advance cone locations so that cones may be placed quickly and accurately and the resulting line of cones will be straight and correctly spaced.
- The *Construction Safety Orders*, Article 11, 1599 (e) requires flagger stations to be illuminated during the hours of darkness. The traffic control system for flaggers should follow Sheet T13 in the *Standard Plans*. Ensure that all flaggers are clearly visible to traffic and that their positioning is safe and effective.
- Workers on foot must wear white or light-colored clothing. Caltrans policy requires Caltrans employees to wear white outer garments. White coveralls are available for state employees. All persons must have reflective markings on their safety garments during the hours of darkness. Reflective material on the vest or outer garment must be visible for a minimum of 300 m, be designed to identify the wearer as a person, and be visible through the full range of body motions. Consider exceptions to the use of white clothing in dense fog or snow areas.
- To maintain the cones, signs, and other safety devices, the contractor must patrol the project's traffic control systems.
- Personnel, representing Caltrans and the contractor, who are capable of and empowered to make decisions quickly if the need arises, must be on the job at all times.

2-209 Delineation

According to Caltrans policy, no undelineated roadway can be opened to unrestricted or uncontrolled traffic. Before opening a roadway to unrestricted public traffic, delineation must be in place. Delineation can be accomplished by one or a combination of the following procedures:

- Placing the final delineation on the roadway
- Using either long-term or short-term temporary delineation
- Using channelizing devices

For a detailed discussion of acceptable temporary delineation methods, see Section 4-12, "Construction Area Traffic Control Devices," of this manual. For a discussion of final delineation and pavement markings, see Section 4-84, "Traffic Stripes and Pavement Markings," of the manual.

2-210 Ramp Closures

Whenever possible, avoid the prolonged closure of freeway ramps when the closure may adversely affect local businesses. Where ramp closures cannot be avoided, minimize the adverse effects to the greatest extent possible.

During the planning and design phase of any project, an impact study is made for any proposed prolonged ramp closure. Local businesses that may be affected are included in the public distribution of the environmental document and are notified of any public hearing.

2-209 Delineation

2-210 Ramp Closures

The district construction unit must request an impact study for any proposed prolonged ramp closures not formally considered in the planning or design phase. Contact the project manager to arrange for the study. It is not necessary to restudy impact previously studied during planning and design unless significant commercial development has occurred in the area in the interim. Before making a decision to approve any contract change order that would result in a prolonged ramp closure, weigh the results of this study with other factors, such as construction costs, travel costs, delay, and safety.

Also, request an impact study for ramp closures of short duration where the possibility exists of adverse effects or where sufficient public concern exists to identify effects on adjacent businesses.

2-211 Informing the Public

Timely publicity can significantly improve traffic behavior on a construction project. A motorist who is forewarned of construction conditions will be more tolerant of delay and inconvenience and probably will be more alert and responsive to construction zone control.

The resident engineer must ensure that information on project road closures, new road openings, traffic rerouting, and changes in traffic conditions is made available in advance for local publicity. Follow the district's instructions for distributing news releases. For guidelines on public information, see Section 1-206, "Relations with the General Public," of this manual.

2-212 Keep it Clear and Clean

To ensure safety and convenience, plans are prepared to provide unobstructed roadways. Periodic project safety reviews should note deficient areas and recommend corrective action by the contractor. During these reviews, examine the locations of planned roadside obstacles along with protective safety devices, signs, stripe, detours, falsework, temporary railing (Type K), attenuators, and run-off zones. Retain documentation of these reviews in Category 6, "Safety," of the project records.

Frequently, the only exception to an otherwise clean roadside is a localized situation such as a partially completed drainage structure or a pile of rubble. Do whatever is necessary to maintain an unobstructed roadside when construction is not in progress.

Ensure all traffic control facilities are kept in good repair. A continuing program of inspection, replacement, and cleaning is necessary.

2-213 Roadways Over Railroad Tracks

When construction activities involve railroad right-of-way or grade crossings, contact the district railroad liaison agent to ensure that all processes are complete and that the contractor may begin work. The railroad company should be represented at a preconstruction meeting to discuss the schedule of work over or near railroad facilities.

The district railroad liaison agent must report to the Public Utilities Commission any proposed detours that include a railroad crossing at grade, where the volume of state highway traffic will materially increase normal traffic using the crossing. Provide the following information to the district railroad liaison agent (who will forward it to the Public Utilities Commission):

- The Public Utilities Commission crossing number as shown on the railroad crossing sign

- The existing protection at the crossing
- The date the detour will be put into use and the estimated time it will be in use
- The estimated volume of traffic to be detoured over the crossing
- Whether or not any additional protection is proposed

If construction involves any structure work, send a copy of the above information to the Office of Structure Design.

Contractors must make their own arrangements with the railroad representative to move materials or equipment across railroad tracks. Should it be required, a contractor must obtain a private crossing agreement.

2-214 Transportation Management Plans

Transportation management plans, including increased ride sharing, service patrols, local agency traffic control officers, and extra media effort, in addition to conventional traffic control activities, have been developed by many districts to cover one or more contracts. The district construction office and the resident engineer must ensure that the contractor's activities are compatible with the transportation management plan that affects the project.

2-214

Transportation Management Plans

2-215 Construction Zone Enhanced Enforcement Program

The Construction Zone Enhanced Enforcement Program (COZEEP) is based on a statewide master agreement between the California Highway Patrol (CHP) and Caltrans. Under the agreement, Caltrans pays the CHP for furnishing officers and cars for use in construction zones. Use the following guidelines and procedures to implement COZEEP.

2-215

Construction Zone Enhanced Enforcement Program

2-215A COZEEP Guidelines

The intent of the following guidelines is to provide a more uniform application of COZEEP resources throughout the state. Use the guidelines when determining when and how COZEEP is to be used on a project. Document the basis for COZEEP use.

2-215A (1) Estimating Funding

Consult your district COZEEP coordinator for a current estimate of hourly and mileage COZEEP cost.

2-215A (2) Redirection of Project Funds

In the detailed estimate, the initial funding level for COZEEP will be shown as supplemental funds for state-furnished materials and services. If additional funds are required during the life of the project, available contingency funds can be transferred to "state-furnished materials and services—COZEEP." Likewise, unused COZEEP funds may be transferred to the contingency fund and used for other purposes.

2-215A (3) Obtaining Additional Funds

Additional funds may be obtained for capital projects and maintenance funded projects as follows:

- Capital projects—If insufficient funds are available in both the supplemental work funds and the contingency funds, propose a fund request. The request may be processed under the G-12 process or may require a California Transportation

Commission supplemental vote. The request should be processed, justified, and documented in the same manner as any other fund request.

- Maintenance funded projects—On maintenance projects, obtain additional funding through a request to the district maintenance unit.

2-215A (4) Responsibility of the Project Engineer

On every project that requires the contractor to close traffic lanes, the project engineer must assess the need for COZEEP. This assessment will be reviewed as part of the project's safety review, constructability review, or both. The project engineer may recommend which specific construction operations should use COZEEP.

The project engineer should include adequate COZEEP funds in the project estimate. Look in the resident engineer's pending file for the design assumptions and estimate calculations.

2-215A (5) Responsibility of the Resident Engineer

The resident engineer must administer the COZEEP program on the project. If COZEEP services are not available, then exercise judgement about whether to allow the work to proceed. If you do not permit the work to proceed and the controlling operation is adversely affected, you may grant a time extension in accordance with Section 8-1.07, "Liquidated Damages," of the *Standard Specifications*.

If the contractor requests additional CHP support beyond that which is included in the project plan, the resident engineer may, if appropriate, write a change order. The contractor must bear the costs and expenses for additional support from the CHP, and all associated costs are deducted from monies due to the contractor.

When evaluating cost reduction proposals and contract change orders requested by the contractor, take into account the costs and savings for COZEEP services.

Initiate and obtain CHP sign-off of Form CEM-2101, "COZEEP Daily Report." At the end of each CHP pay period, report the COZEEP used during the pay period to the district COZEEP coordinator.

2-215A (6) Using COZEEP on Freeways and Expressways

Every attempt should be made to provide COZEEP for the following situations:

- All daytime or nighttime temporary closures of all lanes in the same direction of travel (full freeway closures)
- Nighttime closures of two or more lanes on a freeway with three or more lanes of travel in the same direction

Consider all other closures on a project specific basis.

In general, COZEEP is not necessary when only one lane is closed on freeways with four or more lanes in the same direction of travel.

2-215A (7) Using COZEEP on Connectors and Ramps

For all lane closures on freeway-to-freeway connectors and for night closures of exit and entrance ramps, evaluate the risk factors. Daytime ramp closures usually do not need COZEEP.

2-215A (8) *Using COZEEP on Conventional Highways*

For complete highway closures and for nighttime closures of one or more lanes on multilane highways, evaluate project specific risk factors. In general, lane closures on two-lane highways and daytime closures on multilane highways do not require COZEEP.

2-215A (9) *Risk Factors*

The risk factors discussed below are not intended to be an all-inclusive listing. The safety reviews conducted during the project's development may identify other risks. If so, also consider these risks in the decision-making process.

- Worker escape routes may be blocked by a median barrier, bridge rail, or a retaining wall. Lack of escape options increases the likelihood of motorist involved accidents that will disrupt the traffic flow.
- Night construction activities that do not create an obvious construction zone except while operations are in progress create an unexpected condition for the driver, even to drivers familiar with the highway. Examples of these activities include pavement slab replacement, resealing bridge expansion joints, and replacing pavement markers.
- Construction activities, such as night paving, are a risk factor when they require a large number of truck movements into and out of the work area.
- End-of-queue management is desirable at locations where traffic queues are unavoidable.
- Speed management is desirable at locations such as rural freeways and expressways where traffic has been flowing in a high speed, free flow way for a significant period before encountering the work zone.
- Rural locations with a high volume of truck traffic, steep down grades, or both, also pose a high risk factor.

2-215A (10) *Estimating COZEEP Funding Requirements*

The cost estimate used in the plans, specifications, and estimate is based on the expected number of occurrences of the events needing COZEEP that have been identified during project development. This cost estimate should include an estimated number of COZEEP service hours and travel time converted into an equivalent dollar cost.

When estimating COZEEP hours, take into account the following CHP operating policies:

- CHP policy requires that between the hours of 10:00 p.m. and 6:00 a.m., two officers must be in each unit. (The Department obtained an exception to have one officer per vehicle whenever there are two or more units in close proximity of each other on the same project.)
- CHP officers are reimbursed at time and a half (officers provide COZEEP services on overtime).
- The CHP Memorandum of Understanding requires a minimum payment of four hours per officer.
- All times and mileage are based on the officer starting and stopping time at his or her reporting station and must include travel to and from the project.

The district COZEEP coordinator will provide current hourly and mileage reimbursement costs for the project location.

The project engineer should include in the project estimate the funds necessary to provide COZEEP as state-furnished services and supplies. The basis of the project engineer's estimate should be included in the resident engineer's pending file.

2-215A (11) COZEEP Procedures

The following procedures are intended to assist resident engineers in obtaining and tracking COZEEP services. These procedures were also designed to help Caltrans reconcile the CHP billing system and facilitate payment to the CHP.

2-215A (12) Ordering Work

The statewide master agreement for COZEEP requires that all Caltrans requests for support be received by the supporting CHP area office during normal working hours and at least 72 hours before the time needed.

2-215A (13) Completing the Task Order

To order work by the CHP, use and complete Form CEM-2102, "COZEEP/MAZEEP Task Order."

Before ordering the work, the resident engineer preparing the task order should check the following:

- That the CHP support is appropriate for the type of work to be performed
- That the request has been submitted in a timely manner
- That the project has sufficient funds available to pay for the CHP support

Ensure the task order, which has five parts where information must be entered, is completely filled out. Most of these parts are self explanatory. In Part 4, identify a Caltrans project supervisor, which in most cases will be the resident engineer or an assistant resident engineer.

You may submit a single task order to cover more than one day. For example, a project that will occur on Monday through Thursday for the next week would require only one task order. However, do not submit task orders that do not specify by date and time when a service is needed.

Once the task order is completed and signed by the Caltrans person requesting the services, fax or send it to the local CHP area office. The CHP coordinator at the local CHP area office will complete and sign the form and then return it to the Caltrans construction office.

2-215A (14) Cancellations

If it becomes necessary to cancel the work, contact the local CHP contact person listed in Part 4 of the task order as soon as possible. The statewide agreement requires that all cancellations be made during normal working hours and at least 24 hours before the time that the CHP is to arrive on the project. The cancellation may be written or called in by phone. If the cancellation is made by phone, ensure it is also confirmed in writing (complete Form CEM-2103, "COZEEP/MAZEEP Cancellation Form"). Once contact is made, the CHP coordinator will return the completed cancellation form.

In accordance with the agreement, cancellations received less than 24 hours before work is to begin will be charged a cancellation fee. If you cannot contact the officer in advance and the officer actually reports for duty, the fee will be equal to 4 hours of overtime pay. The local CHP contact person will note in the cancellation form if Caltrans is being charged with a cancellation fee or a 4-hour overtime fee. If the cancellation form indicates a fee is being charged, retain the notice in the project records under Category 21, "Construction Zone Enhanced Enforcement Program" and send a copy of the cancellation form to the district COZEEP coordinator.

For more information on cancellations, refer to the current COZEEP agreement.

2-215A (15) Recording Work Performed

When the officer or officers arrive at the project site, the senior CHP uniformed officer will check in with the Caltrans project supervisor. The project supervisor must initiate Form CEM-2101, "COZEEP Daily Report." The daily report number will also be the project expenditure authorization. In the daily report, enter a description of the services the CHP provided, for example providing traffic breaks, stationary patrol upstream of the work area, or circulating patrol. Also complete the CHP officer and CHP vehicle information. At the end of the shift, the senior CHP officer on the site must estimate the travel time and mileage for each officer to travel from the project site to the CHP office. Calculate the total estimated travel time and mileage and enter the total on the COZEEP daily report. Both the senior officer and the project supervisor must sign the completed COZEEP daily report.

The CHP has five working days to notify Caltrans if the actual travel time, mileage, or both, is greater than the allowances estimated on the daily report. The CHP notification must be submitted to the person who issued the daily report. If a notice of change is received, attach a copy to the resident engineer's copy of the COZEEP daily report and submit the original to the district COZEEP coordinator.

2-215A (16) Tracking Expenditures

Once the district COZEEP coordinator receives the COZEEP daily reports, they must be logged into the COZEEP service summary to track COZEEP use. A spreadsheet may be used for the summary.

Within 15 working days of the end of the CHP's pay period, the district COZEEP coordinator must electronically submit, either through e-mail or on a diskette, the COZEEP service summary to the accounting department at the CHP's headquarters. This electronic submittal must be confirmed with a hard copy.

The CHP will verify this report against its payroll records and add appropriate cost information to the spreadsheet. The CHP will then return the COZEEP service summary in electronic format with a confirming hard copy to the district COZEEP coordinator for payment.

2-215A (17) Reconciling the CHP Invoice

The CHP invoices will include monthly charges for services provided by a CHP area office. The backup for the invoice will include a printout of the COZEEP service summary and copies of any cancellation notices.

The COZEEP service summary, including cost information, must be resorted and subtotaled by project, verified and signed by the district COZEEP coordinator, and submitted for payment to the Caltrans Division of Accounting Services. This

During the term of the contract, the CHP may increase or decrease the rates shown in the contract by notifying the Caltrans statewide contract managers, who in turn will notify the district coordinators. For this reason, district coordinators should not return an invoice to the CHP because the billing rates shown on the invoice do not agree with the rates in the contract. In this situation, the district coordinator should contact the statewide contract manager to verify the correct billing rates.

2-215A (18) Problem Resolution

Drop from the COZEEP service summary any inconsistencies between the information Caltrans gives the CHP and the CHP's internal information obtained from its payroll system. Return the exceptions to the district and area offices involved for resolution. Every effort to resolve disputes at the lowest level (between the resident engineer and the CHP coordinator at the local CHP area office), must be made. If an impasse occurs, the district COZEEP coordinator and the designated contact person in the CHP division office must act as the second level of review. The last level of review will be the COZEEP statewide coordinator and the CHP statewide coordinator.